

505
487

Table 4.
The Inland Water Routes of East China*
(unit: km.-kilometers
mi.-miles)

River	Routes	Distance	Grade
-------	--------	----------	-------

[Face p. 846 (a)]

Yellow River System

Chiaolai Canal	Chiaochowwan—Laichowwan	150 km. (94 mi.)	1
Hsiaoeh'ing River	Tsinan—Pohai	205 km. (128 mi.)	4
Yellow River	Tsinan—T'ungkuan	390 km. (494 mi.)	4

Huai River System

Huai River	Lienyankang—Chengyangkuan	600 km. (375 mi.)	4
	Chengyangkuan—Hsinyang	290 km. (181 mi.)	6
Ch'uan-ch'ang River	Funning—T'ienshengkang	250 km. (156 mi.)	6
Hui River	Wuho—Linhuanchi	180 km. (113 mi.)	6
Li River	Hungtse Lake—Ssuhsien	100 km. (63 mi.)	6

[Face p.846 (b)]

505
487

Yangtze River System

Yangtze River	Shanghai—Hankow	1,100 km. (688 mi.)	1
Yung River	Chenhai—Ningpo—Fenghua	105 km. (66 mi.)	5
Yunhe (Canal)	Ningpo—Hangchow	150 km. (94 mi.)	5
Fuch'un River	Hangchow—Ch'angshan	325 km. (203 mi.)	5
Hsianan River	Chiente—Hsiuning	195 km. (122 mi.)	5
Ou River	Yungchia—Lishui	135 km. (84 mi.)	5
Tach'i River	Lishui—Lung h'uan	112 km. (70 mi.)	5

Min River System

Min River	Minchiangkou—Fochow	56 km. (35 mi.)	1
	Fochow—Nanp'ing	170 km. (106 mi.)	4
Chiench'i (River)	Nanp'ing—P'uch'eng	160 km. (100 mi.)	5
Tungch'i (River)	Chienou—Sungch'i	97 km. (61 mi.)	5
Ch'ungch'i (River)	Chienou—Ch'ungan	137 km. (85 mi.)	5
Shach'i (River)	Nanp'ing—Yungan	160 km. (100 mi.)	5

[Face p. 846 (Q)]

[Face p. 846 (D)]

Chiulungch'i (River)	Yungan-----Ninghua	130 km. (81 mi.)	6
Futunchi (River)	Nanp'ing-----Kuangtse	200 km. (125 mi.)	5
Chinchi (River)	Shunch'ang-----Chianglo	65 km. (41 mi.)	6
Yuch'i (River)	Yuch'ik'ou-----Yuch'i	40 km. (25 mi.)	6
Shuang ch'i (River)	Foochow-----T'angch'eng	85 km. (53 mi.)	6
Mulanch'i (River)	P'ut'ien-----Hsienyu	45 km. (28 mi.)	6
Chin River	Chinchiang-----Yungch'un	85 km. (53 mi.)	6
Chiulung River	Amoy-----Lingyen	290 km. (181 mi.)	5
Lung River	Changp'ing-----Ningyang	43 km. (27 mi.)	5
	Amoy-----Ts'aoli	65 km. (41 mi.)	6

Total 6,515 km.
(4,072 mi.)

* Hsing-ching-yuan Hsin-wen-chü / Bureau of Information, Executive Yuan, Hang-tao-wang / The Navigation Route Network, Nanking, 1947, pp. 19-44.

(Table 4 faces p. 846.)

1:Stanford U. S-4, 5 1956 AF15 East China AF15

505
487

494 Because of the limited supply of gasoline and the minimal domestic production of motor vehicles, the cost of motor transportation is comparatively high in China. But in the coastal regions of East China, where imported fuel is available, the cost may be somewhat lower than in the interior provinces. Large-scale development of motor transportation is still remote. Motor transportation (including short-haul passenger service) is used only in those regions where neither rail nor water transportation are available.

III. INLAND WATER ROUTES

505
487 Water transportation, especially coastal shipping, plays a very important role in East China. Four of the five provinces have coastlines and important seaports. There are two major navigable rivers, the Yangtze River and the Yellow River; other rivers, including the Hwai and the Min, and many smaller streams are navigable by small steamers and junks. Some of the more important navigable rivers are listed in the following table:

505
487

The different "grades" of waterways are determined by the navigability of each river, as explained in the following table:

Table 5. The Grades of Waterways*

Grade	Depth of Water (meters)	Boat Tonnage (gross tons)
1	5-8 (16-24 ft.)	10,000
2	3.8 (12.5 ft.)	2,000
3	3.2 (10.5 ft.)	1,000
4	2.8 (9.2 ft.)	600
5	2.5 (8.2 ft.)	300
6	1.5 (4.9 ft.)	60

* Hang-tao-wang [The Navigation Route Network], Nanking, Hsing-cheng-yüan Hsin-wen-chü [Bureau of Information, Executive Yuan], 1947, pp. 3-5.

The section of the Yangtze River between Shanghai and Hankow and the section between the mouth of the Min River and the city of Foo-chow are classified as Grade 1 routes and can accomodate steamers up to 10,000 tons.

IV. COASTAL SHIPPING IN EAST CHINA

Shanghai is the center for nearly all the coastal shipping routes. There are about eleven

Table 6.
The Coastal Shipping Routes of East China^a
(units: km., kilometers
mi., miles)

Shipping Line	Routes	Distance
Shanghai-Tientsin	Shanghai-Tsingtao-Tientsin	1,104 km. (740 mi.)
Shanghai-Chefoo	Shanghai-Chefoo	318 km. (211 mi.)
Shanghai-Darien	Shanghai-Tientsin-Darien	907 km. (567 mi.)
Shanghai-Yingk'ou	Shanghai-Yingk'ou	1,120 km. (700 mi.)
Amy-Swator	Amy-Swator	200 km. (125 mi.)
Shanghai-Amy	Shanghai-Foochow-Amy	940 km. (580 mi.)
Shanghai-Foochow	Shanghai-Foochow	603 km. (430 mi.)
Shanghai-Ningpo	Shanghai-Ningpo	315 km. (196 mi.)
Foochow-Foochow	Foochow-Foochow	200 km. (125 mi.)
Shanghai-Hong Kong	Shanghai-Hong Kong	1,343 km. (700 mi.)
Swator-Hong Kong	Swator-Hong Kong	501 km. (312 mi.)
Tsingtao-Hong Kong	Tsingtao-Hong Kong	—
Total		7,918 km. (4,949 mi.)

^a Fai-sh'g Ti Heng-yin Chiao-t'ung / Navigation of Communist China,
Taipei, The Sixth Section, Central Committee, Nationalist Party, Part II,
1963, pp. 2-4.

1:Stanford U. S-4, 5 1956 AF15 East China

~~AF15~~

AF15

- 505 routes running between East China seaports
487 and ports of other regions.

~~AF15~~

AF15

396 ship-building probably has been made since 1952. For example, the Chiangnan Shipbuilding Company completed a river steamer for the Minsheng Shipping Company in March 1954.¹⁵ No statistical data on water transportation in East China is available for comparison.

502 The adoption of the "single-file towing" method suggested by Soviet experts has increased both the speed and the volume of water transport on the lower reaches of the Yangtze River. The Yangtze Navigation Administration announced that from March to December 1952, the volume of freight traffic was increased by several hundred-thousand tons over that reported a year previously. A considerable reduction of transport cost in the section between Shanghai and Yu-hsi-k'ou was also reported. The tugboats of the East China Shipping Company pull approximately 24.2 tons of freight per hp. by using the "single-file towing" method as against 7 tons per hp. by the old method.¹⁶ Because it is cheaper to ship by water, the Communists have reduced freight rates on the inland waterways in the East China Region. Freight rates for ten daily necessities shipped

15. Ching-chi Tao-pao [Economic Bulletin], Hong Kong, June 14, 1954, No. 372, p. 30.

16. Navigation in Communist China, Part II, p. 16.

- 505 in the Shanghai-Hankow section of the Yangtze River have been cut 50 per cent below railway rates.¹⁷

The volume of coastal shipping in East China was low in 1950 because of the Nationalist blockade and high shipping rates. In 1951 and 1952, the rates were lowered and the classification of commodities were adjusted, with special emphasis on coal, salt, lumber, and grains on which the rates were fixed below cost in order to increase the volume of traffic.¹⁸

505B. Navigation Administration and Shippers
471

The administrative system of navigation in East China can be divided into two categories, the East China Ocean Shipping Administration, governing coastal shipping, and the East China Inland Waterways Administration, governing inland water transportation.¹⁹ These district administrations are under the leadership of the Ministry of Communications. The former China Merchant Steamship Company, with its

17. Fei-wei Ti Ts'ai-ching Yü Chiao-t'ung [Finance, Economics and Transportation in Communist China], Taipei, The Sixth Section, Central Committee, Nationalist Party, 1953, p. 196.

18. Ibid., pp. 199-200.

19. Ibid., p. 169.

505 head office in Shanghai, was first changed to
471 the People's Steamship Company in 1950 and
reorganized into the Ocean Shipping Admini-
stration²⁰ in 1951. The former Min-sheng
Industrial Corporation, the largest privately
owned shipping company in China, was
reorganized into a joint public-private ownership
concern in 1952 and changed its name to Min-
sheng Shipping Corporation.²¹ A number of
privately owned inland water transportation
firms, including Chung-hsing, Ta-t'ung and
Ta-ta, were transformed into jointly owned
and operated companies. By 1953, about
thirty-four companies had been transformed
into jointly owned and operated firms.²²

V. AIR TRANSPORTATION IN EAST CHINA

509 When the Nationalist were forced to flee
the Mainland in 1949, the two aviation companies,
the China National Aviation Corporation and the
Central Aviation Transport Corporation, took

20. Navigation in Communist China, p. 3.

21. Ibid.

22. Ching-chi Nien-pao [Economic Year Book]
Hong Kong, Ching chi tao-pao she 1954, p. 52.

THE SETTING

312 larly its major commercial artery, Nanking Road, which follows
731 fairly closely the course of a small creek culverted early in the period
of foreign occupance (map 6). It was thus one of the most frequently
flooded areas in the city. Paving along this heavily traveled street
through the heart of the hotel and retail district was removed
for nearly a mile back from the river, and replaced after the ground
level had been raised sufficiently to protect it from all but the worst
floods.

364
505 The numerous tidal creeks (map 6), characteristic of the lower
delta, were useful in the early days of the Settlements as master
drains and for demarcating legally and defending militarily Settlement
boundaries. They were also used for carrying off sewage, where
their tidal ebb was an advantage, and for movement of goods within
the city and to and from the hinterland. The so-called Defense Creek
at the western limit of the British Settlement of 1848 (map 6)
was culverted and covered with a roadway in 1906, a few years after
the Settlement had reached its greatest areal extent in 1899, but the
Yang Ching Pang, which formed the boundary between the French
and International Settlements on the south, remained an open sewer
and transport artery until 1915, when as an enclosed culvert it was
covered over with a broad boulevard named Avenue Edward VII
as a gesture of ideological if not political unity between France and
Great Britain. The remaining uncovered creeks are still important
transport arteries, and as such key factors in the economic life of
the city. While Shanghai has at least to this extent turned its delta
site to advantage (and in a largely unique way as we shall see
below), the problems which the delta has presented far outweigh
its benefits.

The City

361 The site of the original British Settlement, on the left bank of
the Whangpoo at its confluence with Soochow Creek, was deter-
mined by the existing walled Chinese city just upstream, whose
trade had attracted British interest in a concession there (map 6).
Soochow Creek, the original natural and later canalized waterway
to the leading delta city of Soochow for which Shanghai served as
the port, was the primary factor fixing the Chinese city, and it was

THE SETTING

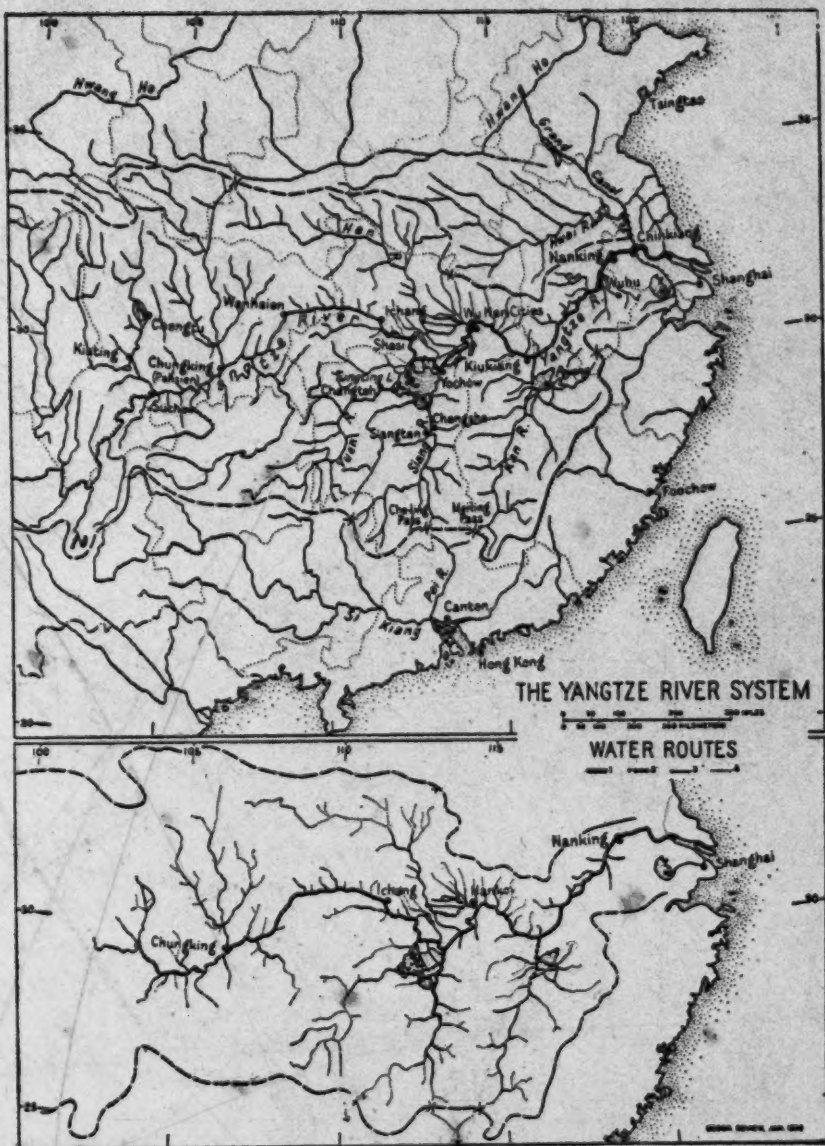
503 Work was begun in 1932 by the Board on cutting a channel of 33 feet at mean high tide through the Fairy Flats, which required the removal of nine feet of silt from the bar as it then existed, including an allowance of three feet for clearance in heavy seas and one foot for fall of the tide during the passage of the ship. By 1936 about three of the nine feet had been removed for half of the distance of the channel. Dredging was suspended during the Japanese occupation and has not yet been resumed during the blockade conditions of the post-war period. Much of the earlier work has thus been lost.

[133] Ebb and flow currents at Shanghai average about three knots for
502 a total of eight hours during each 24-hour period. Six major bends in the Whangpoo (the one at the mouth of Soochow Creek being almost a hairpin turn) and the narrowness of the channel make these tidal currents a problem for ocean-going ships, both in docking and in maneuvering for anchorage. None of the ocean vessels (except for foreign warships, which usually anchored off the Bund) dock above Soochow Creek, and most of them find it easier to unload cargo onto lighters in midstream, taking on cargo at wharves
505 farther down the river in Yangtzepoo.* The wharves along the Bund are used for lighters and for river shipping. Roadsteads within the harbor are severely limited, and collisions and congestion are common.

There have been periodic suggestions that the main harbor be moved to Woosung, but even here conditions are far from ideal. There is a large anchorage in the open roads of the Yangtze with a minimum depth of 30 feet at mean low tide, measuring two miles by six miles, but tidal currents average about a knot stronger than at Shanghai, and these together with the winds across the open sweep of water prevent loading or unloading by lighter about 30 per cent of the time. Existing wharves at Woosung can accommodate only vessels drawing less than 18 feet. Cargo unloaded at Woosung by lighter or at the wharves is mainly carried to Shanghai directly by lighter on the Whangpoo, but there is also some shipment by rail.

The expense and inconvenience of transshipment would probably

* Because of the angle and direction of the tidal currents and the set of the channel, loaded ships can be maneuvered out of the wharves and down the Whangpoo more easily than up the river and into the wharves.

133
505

Map 4. The Yangtze River System (reproduced here by the courtesy of *The Geographical Review*). Numbers refer to: 1, regularly scheduled, all-year steamship runs; 2, waters open to all-year service by steam launches and tugs with barges; 3, waters navigable all year by large native boats; 4, waters navigable all year by small boats.

[p. 46]

LOCATION

47

Nanking

is above the delta proper, and its water connections are limited compared with those of its delta rivals. It has profited primarily from its location at a break in transport routes (including China's major north-south railway, which breaks at the Yangtze — map 8), and from its periodic function as a political capital.

361
487

All three cities have been hampered in their modern development by the lack of harbors adequate for ocean ships. At Hangchow an impressive tidal bore and many shoals in Hangchow Bay preclude use of the Chientang estuary by ocean shipping, and the river itself is navigable only for small boats. Soochow, once a maritime trading center, is now effectively land-locked, and was in any case superseded as a port city by Shanghai by at least the eighteenth century A.D. Nanking, 210 miles from the sea, must contend with silting, river currents, and an exposed anchorage. Both Nanking and Hangchow are handicapped as commercial centers, especially in a region where most goods move by water, by the rugged country around them (map 5), which contrasts with the extensive lowland focused on Shanghai. While all three of these cities were larger than Shanghai before the opening of China to foreign trade and to Western commercial exploitation, they were quickly outstripped by Shanghai under the new economic conditions, where access by water to the entire Yangtze basin and to the major ocean lanes of world commerce gave it a decisive advantage.

504
361
439

The city lies topographically at the focus of the east China lowland, converging on it from both the west and the north, and of the Yangtze basin as a whole (map 2). The river and its tributaries, draining the productive heart of China, all feed ultimately to the mouth of the Whangpoo. In the mainly pre-industrial economy of China, the great majority of goods moving beyond purely local markets do so by water. No other location can marshal a fraction of the advantages of Shanghai on this crucial point.

133
487

Of China's two other major river systems, the Huang (Yellow) in the north is navigable for steam launches for 25 miles above its mouth and for a small part of its course through Honan, but it is otherwise useless for navigation except in short stretches by small boats. The Hsi (West) River in the south is navigable for some 230 miles in the high-water season (spring and summer) for vessels

505

THE SETTING

505 drawing fifteen feet and for the same distance at low water for vessels drawing six feet. Smaller steam launches use the river for about 700 miles at all seasons. The Hsi system, however, drains only about 210,000 square miles, and contains no such extensive lowland as the Yangtze basin (map 2).

On the Yangtze there is an all-year ship channel for 5,000-ton ships as far as Hankow, 600 miles from the river's mouth, and a summer (high-water period) channel to Hankow for 10,000-ton ships. Above Hankow, permanent steamship service is maintained as far as Chungking, 1400 miles from the sea, by vessels up to 2,000-tons, and river steamers also operate to Suifu (Ipin, Süchow), 150 miles farther upstream where the Yangtze leaves the mountain mass of central Asia and is joined by its navigable tributary, the Min, from the western part of the Red Basin of Szechuan. Map 4 shows the extent to which the river's tributaries are navigable by different sized ships (Suifu on this map is referred to as Süchow). The total of inland waterways navigable from Shanghai by junks at all seasons (excluding the canals of the delta) is nearly 30,000 miles, reaching approximately 200,000,000 people. This transport network is reflected in the fact that Shanghai between 1865 and 1936 handled between 45 and 65 per cent of the total foreign trade of China by value.

503 The Yangtze system feeding Shanghai is reproduced in miniature
505 within the delta itself (map 5). A maze of canals dissects the fertile triangle, connecting with natural waterways to form through water links between every village and town in this area and from
[312] all of them to Shanghai. The canals are used primarily for transport, but they also serve as sources of irrigation water for wet paddies and as community water supplies, in addition to providing drainage, which may have been their original purpose.² The alteration of the natural environment which the canals represent has been in progress for at least the last 2,000 years, and now constitutes probably the largest concentration of artificial waterways anywhere in the world.

When the canals are added to Tai Lake and the chain of smaller lakes to its east, the Yangtze, the Whangpoo, Soochow Creek, and many smaller rivers in this area, the landscape becomes an enormously magnified Venice. Within a radius of at least 100 miles from Shanghai it is possible to go from any village or town to any other

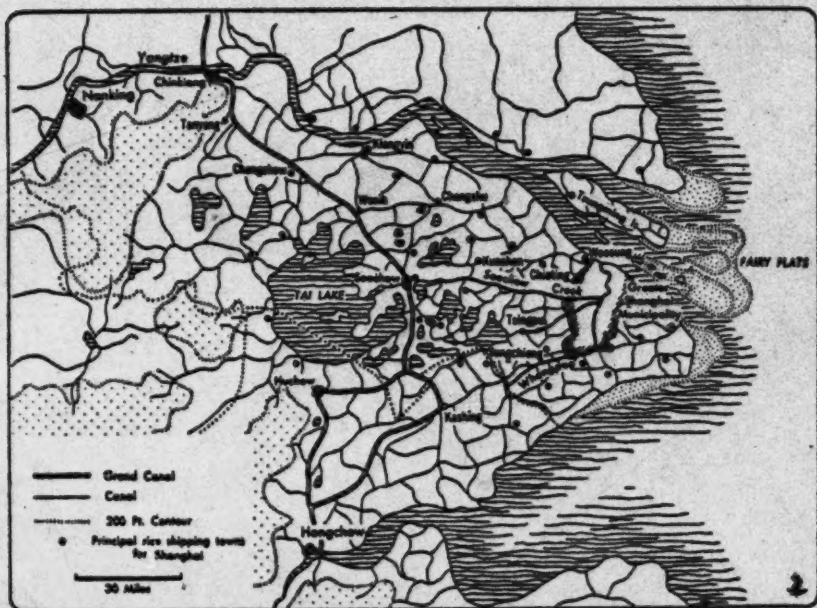
LOCATION

49

village or town entirely by water, and in most cases in no other way. According to existing estimates,⁸ and on the basis of the incomplete cartographic data, the delta area must contain at least half a million miles of canalized or artificial waterways. The railway between Shanghai and Nanking includes in its 193 miles 164 bridges over navigable rivers or canals.

503
505

[496]



Map 5. Waterways of the Yangtze Delta. All waterways shown are navigable. Provincial boundaries are indicated by a dotted line.

The use of water routes is reflected in the sparseness of roads compared with other level areas of China and in the fact that such roads as exist run in most cases at right angles to major waterways. In addition, carts and barrows are scarce in the Yangtze delta, in marked contrast with other areas of China, or with most pre-industrial regions. Traditional Chinese bridges in the delta area are nearly all of the single span hump-backed type, reflecting the virtual absence of wheeled traffic as well as the need to provide adequate clearance over waterways for the passage of masted vessels.

491

[493]

THE SETTING

505 The opening of the Yangtze to steam navigation by about 1862
438 following the Treaty of Tientsin (in 1858 between China and Great
496 Britain; the commercial section of the treaty was not completed
until 1860) ensured the ascendancy of Shanghai over rival southern
ports by allowing the trade of central China to drain by its natural
route, and within a very few years reduced to a trickle the formerly
large volume of trade overland from points outside the Hsi system to
Canton, via the Cheling and Meiling passes. The beginnings of high-
way and railway development in China (map 8) have added to
the trade carried by the Yangtze system, by acting as feeders, just
as any increase in the economic activity of central China will be re-
flected in more intensive use of its major trade artery. The Hankow-
Canton railway, completed through the Cheling pass in 1936, has
tended to augment the volume of goods carried by the Yangtze
toward and from Shanghai, and the same has been true of the
older railway built in 1910 by the French from Kunming in Yunnan,
near the upper navigable reaches of the Yangtze, to the seaport of
Hanoi in French Indo-China. With a complete and well-organized
rail network, transport use of the Yangtze may eventually decline
in relative, though not in absolute importance. At least as far up-
stream as Hankow, railway development may never supplant it as
the major carrier in the lower river basin.*

496 Complementary to the natural focus of water routes, and con-
comitant with the growth of the city, two of China's major rail-
ways (Shanghai-Nanking, with connections north to Tsinan, Tien-
tsin, and Peking, and west to Chenghsien and Sian; and Shanghai-
Hangchow-Ningpo, with connections west to Nanchang and
Hankow and south to Canton) terminate at Shanghai (map 8),
and a small network of motor roads links the city with most of the
other centers of the lower Yangtze basin. The gathering of rail and
highway routes at Shanghai is however a reflection of rather than a

* The importance of the Yangtze as a carrier in future competition with well developed railways may perhaps be compared with the current importance of the lower Rhine, below Mannheim. Although it runs through the heart of a major industrial region with one of the densest and most heavily traveled rail nets in the world (including lines along both banks of the river), the Rhine and its tributaries consistently carry a larger volume of goods than the combined railway lines through its basin.

THE SETTING

477 not employ their own agents.¹¹ At Shanghai, Consul Balfour found himself unwittingly involved in an attempt to create a local Cohong when after some difficulty in finding a house available for leasing as the consular residence on the day after his arrival in November 1843, he accepted the offer of a prosperous Chinese gentleman. His landlord leased him a large house in the Chinese city, and then established himself in the gate house where he carefully observed the comings and goings of his tenants. When Balfour was approached by his host on trade matters, it was revealed that the gentleman was a prominent Shanghai merchant and that by agreement with the taotai he had planned to acquire a monopoly of trade with the foreigners and to keep them conveniently under supervision in polite house arrest. Balfour quickly made other housing arrangements, and in 1846 moved the consulate to quarters rented outside the city in the foreign leasehold.¹²

651 By the end of 1843, eleven foreign trading firms were in business at Shanghai, most of them branches of British and American firms originally established at Canton. The new conditions under which they now operated were unique in the history of the China trade. Escape from the Cohong meant moreover a large saving in customs duties. Average total duties per ship exacted at Canton between 1800 and 1840 were estimated by the foreign merchants at 240,000 taels, of which 200,000 taels represented officially connived-in "squeeze." (The tael was a unit weight of pure silver which remained fairly constant from 1800 to 1860 at the equivalent of seven shillings.) At Shanghai the merchants estimated in February 1844 that since the port had been opened average total duties per ship had been 50,000 taels, of which only about 15,000

505 represented "squeeze."¹³ During 1844 a total of 44 foreign ships entered and cleared the port, and by 1855 the figure had risen to 437.¹⁴

439 The three great trade commodities of this period were tea, silk, and opium (tables I and II), and for all of them Shanghai was advantageously located. The major silk-producing regions of China lie in the lower Yangtze basin. Tea for export was grown primarily in the belt of hills which forms the Yangtze divide on the south, and waterways connected the northern slopes of this region (where

KEY FUNCTIONS

497 railways (exclusive of Manchuria).^{*} The role of railways in the growth of Shanghai has clearly been minor, and they have never become large volume carriers on a Western scale, despite their connections with most of the several large cities in the delta, and despite the relatively great agricultural and industrial productivity of the lower Yangtze basin.

491 The highway pattern is also relatively little developed. Two roads run south from Shanghai to Hangchow (both opened to traffic in 1932), and one runs north to Nanking. A large proportion of the highway mileage runs beside the railway lines, which makes the highways less useful than if they ran independently of or as feeders for the railways. The northern and southern highway routes are joined by a road from Kashing to Soochow, but the few remaining roads are either short-distance feeders or dead ends. There is no direct road connection between the major cities of Soochow and Wusih or Nanking. With minor exceptions in the vicinity of Shanghai, none of these surfaces were paved, and nearly all of the mileage is two-lane only.

494 The paucity of roads is presumably not due either to construction difficulties or to lack of general trade volume, although level ground in this area is usually accompanied by a dense network of natural and artificial waterways over which bridges must be built. The roads were constructed primarily for tourists and for general automobile travel rather than for commercial haulage. At least two of the major links (the shore road from Hangchow to Shanghai and the northern road from Shanghai to Soochow) were legally closed to vehicles over three tons gross weight from the time of their construction.³ Due partly to the high cost of fuel, trucks, and parts, and partly to the generally pre-industrial nature of the economy, the volume of truck haulage on all of these roads has remained slight.⁴

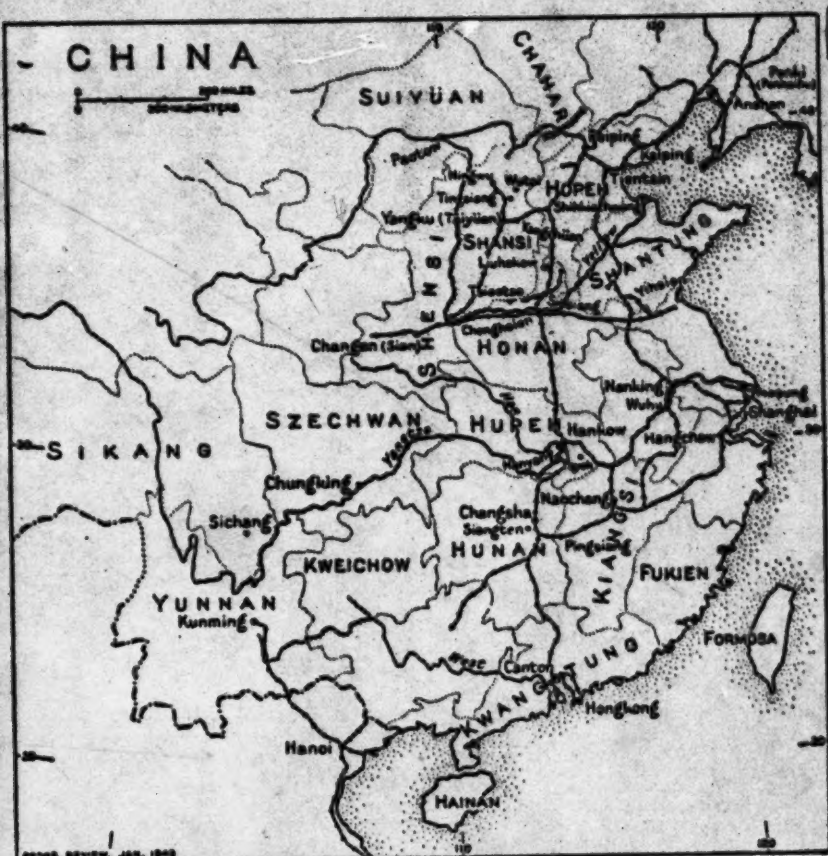
• 505 Within the delta, however, and within most of the Yangtze basin, goods can move so easily and cheaply by water that there is little

496 ^{*} The total length of railways in China proper in 1936 was 9,712 kilometers, of which the two lines discussed above accounted for 753 kilometers (including sidings, loops, branches, and 112 kilometers of second track in and on the outskirts of Shanghai, Nanking, and Hangchow), or 8.3 per cent.⁵

TRANSPORT ROUTES

91

need for mechanized carriers even to supply a city the size of Shanghai. The Shanghai Municipal Council made a traffic count in 1919 on Soochow Creek near its mouth and found a 24-hour average of 1858 cargo boats between 10 and 90 tons cargo capacity

505⁰

[496]

Map 8. Railways of China, as of 1936 (reproduced here by the courtesy of The Geographical Review).

and 807 freight sampans passing the point of count.⁸ Assuming that half of these boats were empty and half were loaded to capacity, and assuming arbitrarily that the sampans had half of the average cargo capacity of the cargo boats, these figures show a volume of

KEY FUNCTIONS

505 haulage on this one creek (the main water connection with the delta hinterland, although there are several others as well) between five and ten times greater than on either of the two railway lines.

In addition to the Yangtze and the Whangpoo, three major water routes connect Shanghai with the delta: Siccawei, Soochow, and Woosung Creeks (maps 3 and 5). The lower reaches of Soochow and Siccawei Creeks were periodically dredged by the Whangpoo Conservancy Board until 1936, and on the former a minimum depth of five feet at low water within a 100-foot channel was maintained as far as Soochow, where the Creek terminates. This enabled boats up to 80 tons cargo capacity to reach Soochow, and to move from there into the wider water network of the delta. Siccawei Creek provides a through route for boats up to 40 tons cargo capacity as far as Tsingpu and from there to Tai Lake. Woosung Creek makes similar connections as far as Kunshan, where it joins several other navigable waterways. Five daily "boat trains" (barges towed by a steam launch) left Shanghai for Soochow during the 1920's and 1930's, a journey of ten to twelve hours. The "trains" carried freight as well as passengers, but more deck-passenger space was available west-bound, presumably because outward-bound Shanghai manufactured goods took less space than inward-bound rice, silk, cotton, or other agricultural raw materials.

489 There were no railway wharves inside the harbor limits. Those at Woosung and Lunghua (both outside harbor limits) were relatively little used, and the Woosung railway wharves handled almost entirely inbound ocean and river cargo destined for Shanghai rather than for other cities. On the right bank of the Whangpoo there was not a single motor road before 1936.* Three large creeks, however, connected the river's right bank with the sea and with the district southeast of Shanghai. The barrier represented by the Whangpoo, and the relatively small and unproductive countryside east of the river were largely responsible for the smallness of commercial and manufacturing development in Pootung. The ship-building, wharves, and manufacturing located there were maintained entirely by water transport.

* In 1936 a short road was built in Pootung, extended to 37 kilometers in 1948, paralleling the river behind the wharves.

TRANSPORT ROUTES

93 C
EC
505

The Yangtze system, of which the delta's waterways are a part, has been outlined above in chapter four. With its channel for ocean-going ships as far as Hankow, for river steamers to Suifu, and for smaller craft still farther, in addition to navigation on its tributaries, the Yangtze is in turn tributary to Shanghai. The hills and mountains which define its watershed are in most cases barriers sufficient to prevent volume movements of goods by land across the divides. The Cheling and Meiling passes (map 4) connecting Canton and the Hsi basin with central China, are the only two exceptions of importance, aside from the open coastal lowlands. By 1890 steamships had become more important carriers than native junks on the Yangtze and the lower reaches of its major tributaries for all but local hauls, but junks have continued to operate over the entire navigable length of the river and are of course particularly important in its upper reaches and along the tributaries.

Junks of the type in use on the lower Yangtze average about 100 tons cargo capacity, and draw between six and eight feet of water, so that they can also use the major delta waterways and most of the Yangtze tributaries. Large rafts are also used on the Yangtze for transporting general goods as well as the timber of which they are made, the rafts being broken up and the timber sold at the end of the downstream trip, as on the Mississippi during the eighteenth and nineteenth centuries. Such rafts were until recently often so big that not only families but entire villages, including barbers, tin-smiths, and restaurateurs lived on them during the downstream trip to Shanghai, which was slowed by the size of the rafts.

While the winter low-water period limits the range of steamships, it tends to make junk navigation easier because of quieter waters and because the easiest towpaths are then exposed along the river bank. Steamships using the river above Ichang in winter frequently tie up for the night, but along many stretches, especially in the gorges immediately above Ichang, junks cannot move with safety during the summer because of the current and because the flood waters covering the winter towpaths are confined between nearly sheer rock walls. On the lakes within the Yangtze basin, notably Tung Ting and Poyang Lakes, strings of barges towed by steamships are the major carriers.

C
EC 94

KEY FUNCTIONS

505 The usefulness of the Yangtze system for the transport of goods is due in large measure to the number of navigable tributaries feeding the master stream, each draining its own highly productive area (maps 1 and 4). Of the major tributaries, the Kan, entering the Yangtze at Kiukiang, is navigable for steamships for 100 miles from its mouth at all seasons, and for 300 miles in summer. Both figures are exclusive of the navigation on Poyang Lake. Steam navigation on the Han from Hankow is possible for 150 miles in winter and for about 375 in summer. Junks and sampans make connections via the Han with southern Shensi. Steamships operate on the Hsiang (Siang) from its mouth in Tung Ting Lake, Hunan, for 150 miles in winter and for 250 miles in summer. On the Chialing, there is steam navigation for about 100 miles from Chungking in winter, and for 280 miles in summer. The Chialing also provides a navigable connection for sampans with southern Shensi and southeastern Kansu. On the Min, regular year-round steamship service is maintained for 80 miles from Suifu. The steamships operating on the Yangtze and its tributaries are predominantly registered in Shanghai, an indication of the extent to which the trade of the river's basin drains to the city.

C
EC
505 These waterways of the Yangtze system were collectively the
133 backbone of China's transport facilities in the nineteenth century, and they have remained so. Their limitations are in general those of unreliability. Stream regimens fluctuate widely through the year in all mid-latitude continental climates. In the moderately monsoonal climate of western and central China, the denuded watersheds of the Yangtze and its tributaries, where intensive agriculture has centuries ago removed most of the original forest cover, make for further seasonal extremes in stream levels. Snow melt-water from the northern and northwestern parts of the Yangtze watershed, and the rains of late spring and summer, drain rapidly into stream channels, and produce a yearly range of 90 feet in the level of the Yangtze at Ichang, and 60 feet at Hankow.

In addition, the Yangtze cuts across the major north-south mountain range of central China in its progress from the Szechuan basin to the east China lowland. Between Chungking and Ichang (the gorges of the Yangtze where it has cut through the mountains

TRANSPORT ROUTES

are between Wanh sien and Ichang), a distance of about 400 miles, there is an average drop in elevation of 14 inches per mile and a total of 15 major rapids. These gorges and rapids are responsible for the break from orthodox ocean and river steamships to special shallow-draft and high-powered steamships at Hankow, which because of its location at the mouth of the Han is a more convenient shipping and commercial center as well as a breaking-point in transport than Ichang, whose hinterland is relatively unproductive and poor in waterways. On all of the Yangtze tributaries beyond the reaches navigable by steamships, navigation by native boats is increasingly seasonal toward the headwaters, and as we have seen above, steam navigation is considerably restricted during the winter low-water period.

The Chinese of the Yangtze basin have learned to make maximum use of existing waterways, with the technical means available to them, and are accustomed to floating rafts and even specially designed junks on one or two feet of water.* Such rafts can carry up to 20 tons of goods and remain waterborne in one foot of water. Spring and summer floods present more of a danger for them than does the winter low-water period. In southwestern Shensi and southeastern Kansu, a region which produces wool, cotton, and hides for export, these products are sent to market during the time of the spring floods by making them up into bundles around which the hides are sewn in a waterproof covering. The bundles are then put into the headwaters of streams leading eventually into the Chialing or Han Rivers, down which they float to collecting centers near the head of junk navigation.

Despite such ingenious adjustments to an environment poor in easy overland routes and rich in waterways, movement of goods along many reaches of the Yangtze system virtually stops during the lowest low-water and highest flood periods, and is seriously hampered even on the master stream by currents, gorges, and rocks. Merchants of Ichang, just downstream from the main gorges of the Yangtze, estimate that about 20 per cent of east-bound boats and

* See Baron von Richtofen, *Letters to the Committee of the Shanghai Chamber of Commerce* (1871), p. 7. He describes navigation in the upper waters of Yangtze tributaries in the central mountain belt on two inches of water.

C 96
EC

KEY FUNCTIONS

- 505 cargoes between Wanh sien and Ichang are damaged in transit, and about 10 per cent of west-bound boats.⁶ Rates of course vary according to the season and to whether the cargo is to be moved up or downstream.

EC 502 More than a few villages along the Yangtze between Ichang and Chungking depended for their livelihood largely on salvage from boats wrecked on the rocks or in the rapids. Many of these villages were engaged in neither agriculture nor fishing. Hsin Tan (the characters mean "new rapids"), some eighty miles upstream from Ichang, was described by the delegates of the Shanghai Chamber of Commerce in 1869 as a large and prosperous town whose wealth derived mainly from its location at one of the most dangerous rapids along the upper Yangtze. The original channel there was blocked by a landslide in the fourth century B.C., and shortly thereafter Hsin Tan was founded a few hundred yards from the new channel, which contained a series of rapids. The new town presumably acted as a lay-over point for boat trackers, but the rapids also yielded another form of income. Navigation on this stretch was originally forbidden by the provincial authorities between November and April, but the inhabitants of Hsin Tan cleared a channel adequate for the passage of boats during the low-water period but not adequate enough to prevent frequent wrecks, from which they realized most of their livelihood.⁷

EC 505 Trade within the Yangtze basin has to adjust itself to the seasonal limitations on navigation. Merchants in each trading place, including 442 Shanghai, are obliged to keep large reserves of goods on hand to tide over the periods of flood and low water, and to be ready to ship in large quantities when navigation is possible. Water transport is also liable to interruption by civil disorder (peasant risings, troop movements, bandits), since boatmen fear expropriation of their craft and cargoes at such times. Foreign traders in Shanghai found that most of the Chinese dealers in the hinterland had insufficient capital to buy goods adequate to ensure a uniform supply, and that it was therefore necessary for local branches of the Shanghai firms in inland trade centers such as Hankow or Kiukiang to keep on hand at all times a minimum of 18 months' supply of goods. Under such conditions, only the largest foreign firms could afford to operate,

TRANSPORT ROUTES

97

since only they could make such large investments, and could spread the risk of loss over many distribution centers in the interior. Only the largest firms could also keep prices reasonably uniform throughout the year by balancing seasonal and regional losses against seasonal and regional gains. 505 442

These operations could not be conducted by foreign firms from a non-Chinese port (such as Hong Kong, or such as was at one time envisaged on Chusan Island), where customs dues and handling charges would be added costs, and because much of the Yangtze trade can best be conducted by junks which are usable over most of the basin's waterways but are not suitable for coastal navigation. Junks drawing between five and eight feet can navigate both the upper and lower Yangtze (i.e., above and below Hankow) as well as most of the major tributaries and the larger waterways of the delta. Their shallow draft and unseaworthiness eliminate them from coastal navigation; a dual-purpose junk would be an overly expensive carrier. Cargo packed at the Shanghai headquarters of foreign firms for shipment to inland centers can be packaged more cheaply for river transport than would be possible for non-Chinese entrepôts dependent on coastal shipping for their connection with the transport routes of the mainland.* 505

All of these factors, in particular the advantages accruing to the largest firms from the seasonal variations in water transport facilities, redounded to the benefit of Shanghai, since the great majority of the largest foreign and Chinese firms engaged in the import and export trade had their headquarters there. Hankow was handicapped in its direct foreign trade by the low-water period of winter, during which most ocean ships could not reach the city. Shippers preferred to operate out of Shanghai as the only year-round ocean port for the Yangtze basin.

The advantages of unfettered access to this trade artery were apparent to the early foreign traders at Shanghai before the Yangtze was opened to foreign steam navigation by the commercial section 648 439

* A statement from a "businessman of wide experience in China," cited in R. C. Feetham, *Report to the Shanghai Municipal Council* (1931), I, 289-90, makes many of these points. What is discussed here is of course the "break-in-bulk" theory. The statement goes on to say that "fully 80 per cent of cargo delivered to ultimate consumers in China moves via waterways."

TRANSPORT ROUTES

99

Chinese commercial houses in Hankow were branches of Shanghai houses.* 439

The foreign merchants at Shanghai, aware that their trade was increasingly based on the commercial exploitation of the entire Yangtze basin now made possible by the new treaty, combined in 1868 to finance an expedition under the leadership of Alexander Michie and Robert Francis to explore the trade of the upper Yangtze. The leading American firm in Shanghai, Russell and Company, paid the travel expenses of the expedition by steamship as far as Hankow, and the remainder of the expenses were met by the Shanghai Chamber of Commerce, from which body the members of the expedition had been selected. 484
505 ●
438

The report of these delegates, published in 1869, stressed the importance of water transport in the trade of major commercial centers along the Yangtze, and in the overall movement of domestic trade to and from Shanghai. They noted the extensive tea shipments moving via the Kan River and its tributaries and Poyang Lake to Kiukiang and Hukow and thence via the Yangtze to Shanghai. They commented on the widespread water connections of Hankow, via the Han River system, which brought tea, hides, hemp, timber, and vegetable oils for transshipment to Shanghai, and via the Hsiang River system, which brought mainly tea and cotton. Szechuan sent hemp, hides, bristles, tea, vegetable oils, and opium via the Yangtze to be transshipped at Hankow for Shanghai, these goods having originally been assembled at Chungking via the Chialing, Yangtze, and Min Rivers.¹¹ 505
438

British dominance of the trade of the newly-established treaty ports was secure, but the organic connection between the growth of their primary stronghold at Shanghai and a similar dominance of the Yangtze hinterland which fed it was perhaps the most compelling reason for the early development of Britain's traditional sphere of influence in central China and throughout the Yangtze basin. In north China they could better afford to give ground later in the nineteenth century to Russia and Germany, and in the south to 648
439

* The British consul at Hankow notes this pattern in his trade report for 1865, which further emphasizes the conditions of Yangtze trade favoring a monopoly by the large Shanghai firms.

TRANSPORT ROUTES

103

city long after tea and silk had lost their commanding positions. The import of opium into China was legally abolished in 1917 by the terms of an international convention (see below, Chapter Eight), and it disappeared from customs figures at that time. But it was clearly still a powerful generator of capital and trade in the Shanghai of the 1930's. Opium also became a highly profitable export from Shanghai once its import had been officially banned, though as a then wholly illegal trade its volume and mechanics can only be guessed at.*

548
439

It also appears likely that the activities of Chinese opium merchants and distributors during the period from about 1800 to about 1870 helped to pioneer the commercialization and integration of the China market for sales of foreign goods, and that the later rapid spread of merchandizing, especially from Shanghai, was in some measure due to this earlier development of the techniques of commercial exploitation. Concurrently, opium continued to flow into Shanghai for domestic marketing and even for export, a trade which under the circumstances was increasingly profitable.

Tea and Silk

However, it was the trade in tea and silk, the two dominant staples of China's export trade until the close of the nineteenth century (table I), whose contribution to the commercial growth of Shanghai is clearest. The city's original near-monopoly as a result of the concentration of tea and silk production in or near the delta was further implemented by the opening of the Yangtze and its ports by the Treaty of Tientsin.

439

Transport costs for tea and silk by overland routes were high, averaging during the 1860's and 1870's 13 taels per bale of silk (approximately six bales to the ton), and 12 taels per hundred chests of tea (approximately 100 chests to the ton), for 200 miles. Taking the tael at this period as equivalent to about 6s 2d, these rates work out at about £24 per ton of silk (US\$56 per ton/mile), and £21 per ton of tea (US\$50 per ton/mile), as compared with

494
505

* See R. d'Auxion de Ruffe, *La Force de l'Opium* (Paris, 1939), for a somewhat bitter *ad hominem* account of opium smoking and the opium trade in Shanghai, against the background of local and international measures designed to suppress it.

KEY FUNCTIONS

494
505
● average per-ton costs over similar distances in the same areas for ordinary goods of about £12 (US\$30 per ton/mile).¹⁵ Tea and silk required special handling, and neither was supposed to get wet or to touch the ground during its transport.* These rates compare with an average of about £14 per ton for tea and silk over similar distances by water transport.¹⁶ Shanghai's water connections were thus a vital advantage in securing for it the lion's share of foreign trade in these two leading commodities. Robert Fortune estimated in 1848 that transport costs for tea from the hinterland to Shanghai averaged about 50 per cent of total costs to that point, while he estimated the figure for Canton at 70 per cent.¹⁷

651 A desire on the part of the Ch'ing Government to continue the diplomatic and economic advantages resulting from the monopoly system of the Canton Cohong was apparently combined with a desire for increased revenue from the newly expanded trade with the foreigners in a movement to tax tea and silk exported via Shanghai at the same rate as would have been applied if these had moved out via the much longer route to Canton. The resulting Imperial Edict of 1845 ordering the imposition of extra transit dues on this basis had, however, only a nominal effect, since the locational advantages of Shanghai meant that the saving in transport costs and interest charges on tea and silk shipments more than made up for the additional dues.¹⁸

[245]
505
487 Map 9 shows the major tea-producing areas of China in the nineteenth century. The Yangtze itself runs through the northern part of the area producing the best quality teas, and its tributaries and the Chientang River (with its mouth at Hangchow, from which multiple waterways lead to Shanghai) drain most of the remainder. In spite of its river connections into this area, Wenchow was not a major tea exporter. This was certainly due in part to its relatively late opening to foreign trade, but that fact is in itself related to the high relief in Wenchow's hinterland, through which interrupted navigation provides the only adequate means of trans-

482 * For overland transport, they were carried in special frames mounted on porters' backs, with a supporting stick attached so that the load could be rested without being set down on the ground. For water transport, special care was taken to see that tea and silk were kept in clean dry holds or securely under cover. See Robert Fortune, *A Journey to the Tea Countries* (1852); Richtofen, *Letters to the Committee*.

KEY FUNCTIONS

505 port. Most of the teas from this area could move out more easily
487 by water to Ningpo, or to Hangchow for transshipment to Shanghai. Foochow and Amoy drew their tea for export primarily from the southern part of the chief producing area, by way of the rivers which terminate at each port, and Canton depended for its tea supply mainly on the route through the Meiling Pass. Ningpo, situated on an indifferently navigable river, in fact drew some of its tea for export from the Chientang basin, via a canal from the Chientang ten miles upstream from Hangchow, but even so three portages were necessary between the river and Ningpo.¹⁹

245 Shanghai could draw tea from almost all of the chief producing area with much greater facility. Tea in China, as in most of the important tea areas of the world, is a mountain or a hillside crop. It is displaced from the lowlands by grain crops, and it is considered by the Chinese that a more fragrant leaf is produced on slopes and at higher altitudes, where drainage is good, nights are cool, and mists are frequent.²⁰ In the chief producing area, most of the tea is grown at elevations between 1000 and 2500 feet, and was thus necessarily transported by portage to the local curing and collecting centers. From these local centers, however, the tea moved to larger collection places and to ports of export predominantly by water, especially after the Yangtze was opened to foreign trade.

505 All of the leading tea districts of the area producing the best
439 quality teas (map 9) have through water connections with Shanghai, while only a few of them have similar connections with Foochow, Ningpo, or Wenchow. Amoy and Canton have no through water connections with this area except by sea.²¹ Hankow acted as a collecting center for the teas of Szechuan, Hupeh, and Hunan, brought there largely by water and largely transshipped to Shanghai for export, although direct exports of tea from Hankow during the late nineteenth and early twentieth centuries amounted to about one quarter of the amount transshipped to Shanghai for export.²²

245 The tea of central China is grown in the northern and southern
505 highlands of the hill and mountain ranges south of the Yangtze
487 (called by Cressey the "South Yangtze Hills"), with the better quality teas coming from the northern highlands. The tea leaves are

TRANSPORT ROUTES

107

picked as a rule three times a year: in April, May, and September, so that the bulk of export shipments comes during the summer high-water period, but occasional picking and regular shipments from the collecting centers continue through most of the winter. The stream pattern is better developed in the northern highlands than in the southern, and it focuses ultimately on Shanghai, either directly via the Yangtze, or via Hangchow. The less well developed stream pattern of the southern highlands drains to at least five separate ports, each in its own isolated river basin.

245
505
487

Along these streams, as along all of the rivers in China, successive trading centers developed at each break in navigation necessitated by rapids or by a change in the depth of the water where junks gave way to sampans or sampans to bamboo rafts. More of these trading centers which acted as collection places for tea are located north of the divide than south of it, and they naturally tended to ship their teas to northern ports for export, although the normal routes were occasionally abandoned in favor of roundabout routes in order to avoid excessive local transit taxes or arbitrary dues, as for example the shipment of tea from the upper Chientang basin overland to Ningpo and thence by sea to Shanghai.²³

505
487
[65]

The cargo capacity of the boats, and hence the freight rate from these local centers to larger regional collecting centers, varied sharply with seasonal changes in the water level. In a tea area approximately 150 miles up the Chientang River from Hangchow in 1870, rates for transporting 100 chests of tea to Hangchow varied during the year from Mex\$20 in summer to Mex\$50 in winter.* During the summer the average time for tea in transit to Hangchow was five days, as against ten days in winter, while goods moving from Hangchow to the area in question took about twenty days at all seasons.²⁴ The use of water transport in this case is clear from the fact that these rates and transit times follow so closely the conditions of stream navigation, and are the only ones quoted for the tea trade in this area.

W. H. Medhurst in the account referred to above in Chapter Five commented on the fact that tea, at that time marketed entirely by Chinese merchants at the treaty ports, moved to Shanghai from the

* Mex\$1 at this period equaled about US\$.80

KEY FUNCTIONS

505 producing areas by water, but that many of the routes to Canton
487 began on land and were interspersed with portages. Medhurst also
noted that tea was being shipped in large quantities from the
northern highlands of the divide to Shanghai, via the smaller
tributaries of the Yangtze in Kiangsi and Anhwei.³⁵ Robert
Fortune (see above, Chapter Five) visited the same areas a few
years later, also in disguise as a Chinese. His account corroborates
in more detail the general impression of Medhurst that tea from
nearly all of the collecting centers in the area producing the best
quality teas moved to Shanghai by through water routes, while
some part of all of the routes to Canton lay on land.*³⁶

505 By 1867, the British consul at Shanghai, in commenting in his
439 trade report for that year on the greatly increased trade of the port
resulting from the opening of the Yangtze, gave his opinion that
the greater ease, cheapness, and speed of transport for tea to
Shanghai had resulted in a decline in the quality of the tea. He
considered that less care was taken with grading and packing the
tea for the short haul to Shanghai (where its cost price was of course
considerably lower than it had formerly been at Canton), and that
it therefore often arrived stale and poorly sorted. This may illustrate
in reverse the common association of high unit-value and high-
quality goods with high transport costs. He added that before the
opening of Shanghai, tea from the northern slopes of the divide
frequently spent six months in transit to Canton, but that the average
transit from this region to Shanghai after the opening of the Yangtze
was approximately six weeks.³⁷

However, it was as much the great increase in the volume of the
tea trade through Shanghai, in which many more producers were
able to enter the export market with the drop in transport costs,
which accounted for the decline in quality of the tea. This was no
longer a small-scale, specialized, luxury business, but a large com-
mercial enterprise, made possible by uninterrupted water connections.
It was clearly these transport advantages of Shanghai as much as
its relative nearness to the tea-producing districts which were

* Tea grown along the Hsi-Yangtze divide (the area known as the "Bohea Hills") was necessarily moved to collecting places north or south of the divide by porter.

TRANSPORT ROUTES

109

responsible for the city's commanding position in the tea trade. Its tea exports rose from one million pounds in 1844 (the year after it was opened to foreign trade) to 80 million pounds in 1855. Smaller amounts continued to be exported direct via Hankow, Kiukiang, Ningpo, Foochow, and Canton, but by 1855 Shanghai accounted for 58 per cent of the total, and in 1864 (two years after the effective opening of the Yangtze) for 64 per cent.²⁸

For the silk trade, Shanghai was even more favorably located. From the opening of the treaty ports through the 1930's, there were four principal silk-producing areas in China (map 9): the Canton region, producing so-called "soft" silk; central Szechuan, producing "yellow" silk; northeastern Shantung, producing "tussah" silk; and southern Kiangsu-northern Chekiang.* This last was by far the largest producer, and its silk (known generically to the foreign merchants as "China" silk) was considered by both Chinese and foreign traders to be the finest in the world.† Kiangsu and Chekiang together accounted for about half of the total production of raw silk in China through the nineteenth century and into the 1930's, while the Canton region accounted for about 20 per cent, Szechuan for 15 per cent, Shantung for 5 per cent, and Hunan and Hupeh together for 5 per cent.²⁹

The area around Tai Lake was the major center within the Kiangsu-Chekiang silk region. In certain districts there, notably around Wusih, Soochow, and Huchow, mulberry displaced rice as the first crop, and nearly all of the farmers were engaged in silk culture during the six-week worm-rearing season in April and early May. Hangchow was also a leading silk center, and was especially important in silk reeling and weaving. The cocoons were reeled and the silk spun into yarn either in these cities (and lesser centers), or in Shanghai, but nearly all of the silk produced in this

* Silk for export also came in smaller quantities from Honan and Anhwei (notably Wuhu). Hopeh and Liaotung (southern Manchuria) were important "tussah" producers in addition to Shantung.

† The study of the silk industry and trade published in 1881 by the Maritime Customs (Special Series #13) includes an account by the Rev. Mr. Milne, a British missionary who traveled around the delta and a little beyond in the mid-1840's, disguised as a Chinese. He details the nature of silk worms and describes their care and the production of silk according to the traditional Chinese ideas and practices, expressed in picturesque language in the spirit of the Chinese texts.

505
439

231

KEY FUNCTIONS

231 "China" silk area for foreign trade was marketed in Shanghai, through both Chinese and foreign trading firms, who sold it for export. Steam filatures for the reeling and spinning of silk had largely replaced domestic reeling and spinning by 1920, but this did not affect the concentration of silk marketing in Shanghai, since the reeling centers remained tributary to Shanghai and since the silk-reeling industry was also concentrated, in differing degrees at different periods, in the city.

[177] After the introduction of cotton from India in the Yüan dynasty (1260-1368) and the manufacture of cotton cloth in China on a large scale by the end of the Yüan, this much cheaper fabric largely displaced silk, which previously had been produced in almost every region of China and was universally worn. The quality of the silk also declined. By the end of the eighteenth century only the four major areas listed above were important silk producers, but the great increase in China's foreign trade, especially in tea and silk, which followed the opening of the treaty ports stimulated both the quantity and quality of silk production in these areas, most of all in the chief silk region of the Yangtze delta, where foreign traders were closest on the scene.

231 The leading silk areas within the delta coincide closely with the areas where navigable waterways are most numerous. The upland districts south of Nanking and west of Tai Lake, where waterways are relatively sparse, are largely avoided by silk culture. This is mainly due to the fact that silk culture is a painstaking and time-consuming process which requires prodigious amounts of hand labor. It is therefore heaviest in lowland areas with a dense population, as is the case with nearly all of the silk producing regions of China, but such a location facilitates a virtually exclusive dependence on water transport for marketing the silk. This in turn tends to make Shanghai, as the primate commercial center of the delta, the dominant market for silk exports, since it can draw silk from the producing areas by water transport nearly as easily and cheaply as can inland centers.

505 Every important cocoon and filature center in the delta has multiple water connections and depends on them for the collection of cocoons and for the marketing of silk. Liu Ta-chün in his study of

TRANSPORT ROUTES

III

the silk industry makes this clear, and uses the case of Huchow ²³¹ as an example. No less than sixteen navigable waterways connect ⁵⁰⁵ Huchow with the local silk culture districts, and with Shanghai, where the bulk of its cocoons and spun silk was marketed.⁸⁰

Shanghai was also the primary market for the silk exports of Szechuan, Shantung, and Hupeh-Hunan. Before 1843, and to a lesser extent until 1862, the silk exports of these areas went to Canton via the Cheling and Meiling passes, or from Shantung by coastal junk, but after the opening of the treaty ports, and particularly after the opening of the Yangtze, these exports moved out via the much nearer port of Shanghai. The silk areas of the upper Yangtze basin, notably in Szechuan, are closely related to the Hsi and Chialing Rivers, or to the Yangtze itself. With free navigation throughout the river system, it was natural that this silk should be marketed through Shanghai.

Before the abolition in 1834 of the East India Company's monopoly ⁴³⁷ of the British trade with China, yearly exports of silk from China averaged under 6,000 bales. By 1840 the figure had risen to 16,000 bales, largely as a result of the new volume of trade by private firms out of Canton.⁸¹ However in 1844 Shanghai, one year after its opening to foreign trade, exported alone 6,433 bales, and by 1855 the figure for Shanghai had risen to 92,000 bales, or over 60 per cent of the total exports of silk from China.⁸² By 1864, after the opening of the Yangtze, Shanghai accounted for approximately 64 per cent of China's silk exports, and in 1930 for 62 per cent, as against 29 per cent in 1930 for Canton.⁸³ Canton was left with only the local silk areas in Kwangtung to draw on, while Shanghai in 1925 drew 30 per cent of its spun silk exports from filatures in the city (whose cocoon supply came almost entirely from the delta), 10 per cent from other delta filature centers, 11 per cent from Szechuan filatures, 15 per cent from Shantung filatures, 9 per cent from Hupeh-Hunan filatures, and 25 per cent from domestic reeling, primarily in the delta.⁸⁴ Cheap transportation made it possible for Shanghai to add to its monopoly of local silk marketing for export the silk of all the other leading areas except for Kwangtung itself.

KEY FUNCTIONS

438 stopped the marked growth in Shanghai's total trade was due predominantly to the opening of the Yangtze, and it was this new commercial sphere with its new commodities which after 1880 increasingly supported the city.

Shanghai's commanding position for marketing is revealed in the fact that between 1860 and 1930 it accounted for an average of 68 per cent by value of the total re-exports of goods from Chinese ports to Chinese ports. For the period 1925-1935, goods re-exported from Shanghai to Chinese markets went (according to percentages of the total value of such exports) to Kiangsu and other provinces as shown in the accompanying table.²²

Kiangsu	18	Szechuan	8
Chekiang	17	Honan	6
Anhwei	16	Fukien	3
Hupei	11	Shantung	2
Hunan	9	Other	1
Kiangsi	9	TOTAL	100

In a largely pre-industrial economy still characterized for the most part by local rather than regional or national markets, these figures show a truly remarkable areal extent over which Shanghai was able to market (and to purchase) its goods, and the degree to which Shanghai served as the dominant place of exchange for China as a whole. They suggest a close relationship between the size and areal distribution of the market and the waterways and sea routes which focus on the city.

669
• 505
438 Political and military events in 1926, and later during 1937 and after, re-emphasized the importance to Shanghai of this water network for the supply of its trade and industrial goods and for the distribution of its exports. Civil war was widespread in the middle and lower Yangtze basin during the latter half of 1926 as part of the campaign of the Kuomintang against the local and northern warlords. Commandeering of boats, including native craft and 13 out of the 31 Yangtze steamers of the China Merchants Steam Navigation Company by December 1926, led to the suspension of nearly all river sailings between Shanghai and Hankow by Chinese vessels before the end of the year. British and Japanese shipping

TRANSPORT ROUTES

115

firms continued to operate, but under difficulties, and they could not handle more than a small fraction of the normal volume of trade on the river. As a result, sales of piece textile goods in Shanghai had fallen by January 1927, to one quarter of their August levels. The kerosene trade out of the city was badly hit, and large stocks accumulated in warehouses. Imports of Chinese tobacco leaf to Shanghai virtually ceased by January, and forced the closure of several of the large cigarette factories. Egg imports to the city in January were less than 30 per cent of normal. By the end of 1927, with order restored in the Yangtze basin and navigation no longer interfered with, Shanghai's trade with its hinterland returned to normal levels. Both railway lines serving the city remained in regular operation for all but a few days during this period.⁸⁷

In November 1937, in order to hamper Japanese naval movements on the Yangtze, the Chinese Government placed booms across the river at Kiangyin and Chinkiang, and fighting in the delta area and upstream from Nanking further disrupted traffic. The value of Shanghai's foreign trade fell by 76 per cent between July (hostilities began at Shanghai on August 13, 1937) and December 1937, as much because of the interruptions in transport as because of the local fighting, which ended at Shanghai itself in October. During the same period, the total value of the foreign trade of China as a whole decreased by only 2 per cent. Shanghai's relative decline continued through 1938, with a 49 per cent decrease in imports and a 63 per cent decrease in exports over the 1927 figures, while for the same period the total foreign trade of China increased by 8 per cent.⁸⁸ With its water connections disrupted, Shanghai could no longer compete commercially with rival centers, which despite the progress of hostilities over nearly the whole of east China by the end of 1938 increased the total of their trade at the expense of Shanghai.

But the disruptions of war should not obscure the fact that the Yangtze basin is the economic heart of China, nor that its river system will continue to be a basic element in China's transport pattern. The city at the mouth of the river will remain a metropolis under whatever conditions the future or the Communist Government of China may impose.

669
505
438726
439

505

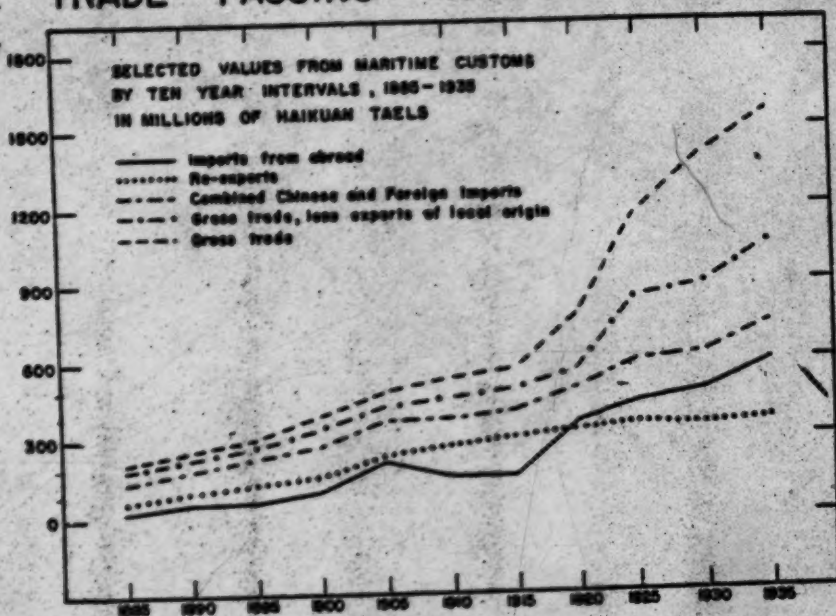
130

KEY FUNCTIONS

438 Chinese vessels beyond the purview of the Maritime Customs. We
 439 are obliged to rely on reasoned estimates by customs officials and
 other observers, and on the partial evidence contained in customs
 records.

505 Shipping from foreign ports entering Shanghai averaged about
 650,000 tons monthly from 1933 to 1936 inclusive, according to the
 records of the Maritime Customs. During the same period, coastal

TRADE PASSING THROUGH SHANGHAI



Graph 8

505 shipping entering Shanghai through Maritime Customs averaged
 about 640,000 tons monthly, while shipping entering from inland
 (i.e., Yangtze River) ports averaged about 250,000 tons monthly.
 These figures are exclusive of Native Customs, which recorded at
 Shanghai during 1930 a total of 54,410 junks entered and cleared
 (no tonnage given).¹¹ Combining the Maritime Customs tonnage
 figures, and adding a conservative 20 per cent for the recorded and
 unrecorded shipments by junk and sampan, gives a total for coastal
 and inland shipping (640,000 tons plus 250,000 tons plus 20 per cent,

THE TRADE OF THE PORT

131

or 1,068,000 net tons monthly) 40 per cent greater in volume than shipping from foreign ports (650,000 net tons monthly). Among the domestic imports, food and industrial raw materials for the city, and among the exports, products of Shanghai manufacturing (or original exports) probably accounted (as we have seen in the above analysis of graphs 6, 7, and 8) for 50 to 60 per cent of these shipments to and from Chinese ports, but the remainder, or 40 to 50 per cent, was transit trade.* 505 438 439

Other published estimates corroborate the estimates of the relative importance of Shanghai's transit trade given above. The *Journal of The British Chamber of Commerce* at Shanghai in its issue for February 1920 estimates that about 65 per cent of the shipping of all types entering and clearing Shanghai was destined to or from coastal or Yangtze River ports, and only 35 per cent was engaged in overseas trade. Bowman estimates that about 50 per cent of Shanghai's imports of foreign goods were re-exported to ports on the Yangtze—20 per cent to ports below Hankow, 15 per cent to Hankow itself, and 15 per cent to ports above Hankow.† In the cotton trade, Fong Hsien-ting estimates that between 1920 and 1930 Shanghai accounted for an average of 80 per cent of China's total exports of cotton piece goods, although less than 60 per cent of this 80 per cent was produced in Shanghai.¹²

Finally, published citations of the records of the Native Customs at Shanghai add a not inconsiderable figure to the total values of domestic trade as shown in graphs 6 and 8. The Native Customs in 1928 recorded total imports from Chinese ports to Shanghai to the value of approximately 65,000,000 Hai-kuan taels, and total exports from Shanghai to Chinese ports to the value of approximately 46,000,000 Hai-kuan taels, or a grand total of 110,000,000.¹³ In 1930, this grand total had risen to over 114,000,000 Hai-kuan 438

* During the same period (1931-1936 inclusive), the railway line to Nanking carried into and out of Shanghai a monthly average of about 80,000 total tons of freight, and the line to Hangchow a monthly average of about 40,000 tons, according to Ministry of Communications, 1931-1936. These two figures combined are less than 12 per cent of the total domestic waterborne trade as estimated in the preceding paragraph (1,068,000 net tons).

† Bowman's estimates take into consideration the unrecorded trade carried in junks and sampans. Of the major Yangtze ports, only Chinkiang, Nanking, and Wuhu have direct rail connections with Shanghai.

KEY FUNCTIONS

438 Most of the places so mentioned recur every month except during
 489 the rice planting season from early May to early June, and nearly all of them cluster within a relatively small area in the immediate neighborhood of Shanghai (map 5). In about half the cases they are *hsien* towns (county seats), which presumably draw on most of their respective *hsien* (counties), and in the other cases simply towns or villages which serve as collecting places for the rice-producing areas immediately around them. For the most part, they are located with indifference to existing road and railway networks. Most of the exceptions are large towns through which the road and/or railway are obliged to run in any case. The majority of the places however are located on main waterways, and in every case there is a direct water connection with Shanghai.

433 When the rice supply pattern for Shanghai as shown in these
 438 reports is compared with total figures for rice production in Kiangsu province by *hsien*,¹⁴ it is seen that for the most part only the heavy rice-producing *hsien* which lie within about 75 miles of Shanghai send amounts to the city significant enough to be recorded consistently in the market reports. If a surplus exists in the other heavy rice-producing *hsien* * then either transport costs to Shanghai are too high for this rice to compete with areas nearer the city and it therefore moves to other consuming centers, or Shanghai can draw sufficient amounts from the nearer areas at a reasonable price to fill the majority of its rice needs.

For example, Kashing, an important rice marketing center on the railway 60 miles southwest of Shanghai sends little of its rice to Shanghai, although it does send large amounts of locally produced ginger. The comparatively high unit-value by weight of ginger can bear transportation costs which make shipment of rice uneconomic by either rail or water in this case. Another rice center, however, 19 miles farther south on the railway, sends large amounts of local rice to Hangchow 39 miles away. It is near enough apparently to be included in Hangchow's tributary rice area.¹⁵

438 Although water transport, especially in this delta area, is relatively
 505 easy and cheap, it is also relatively slow, and it is reasonable to find

* Kiangsu government figures indicate that this is the case — *Kiang-su sheng-chien*, cited above.

KEY FUNCTIONS

438 that for the most part beyond approximately 75 miles from Shanghai,
 505 the time-distance-transport costs make water shipment of rice un-
 economic under present conditions. It is correspondingly a logical
 conclusion that the heavy dependence of Shanghai on this small
 local rice-supply area is implemented by the Venetian network of
 [435] canals and natural waterways in the immediate hinterland of the
 city. Discussions of rice production and marketing in the delta area
 state that rice moves to both local and distant markets almost
 entirely by junk or sampan, and that in hilly areas with little or no
 water transport (such as the country southeast of Nanking, or
 west and south of Hangchow) the local market price of rice is
 double the price in the delta lowlands.¹⁶

The crucial importance of water transport in the pre-industrial
 economy of China as a whole is heightened in the Yangtze delta
 area, where water routes are so highly developed. Shanghai lies at
 the focus of these routes, and of the level terrain of the delta over
 which transport by water can operate at optimum efficiency. This
 has been a vital factor in making possible the development of a city
 of four million people.

438 The Shanghai rice merchants divide their main supply areas into
 439 three categories: a. local rice (roughly from within a 75-mile
 radius); b. out-province rice (from Anhwei, Kiangsi, Chekiang,
 Kiangsu north of the Yangtze, and at scattered intervals from
 Hunan); c. foreign rice (from the Indo-Chinese peninsula, mainly
 ex-Saigon, but including small amounts from Bangkok and Ran-
 goon).*

435 The factors influencing the rice market in Shanghai and its general
 439 behavior through the year throw considerable light on how the city
 is fed. These factors (in addition to the amount and quality of the
 rice harvest in the main supply areas) may be summarized as
 follows:

1. The price of foreign and out-province rice. Average monthly
 prices for the three area categories of rice for the period 1920-1936
 were approximately as follows: a. (local rice), CNC\$12.00† per

* The export trade in rice from Indo-China, and to a lesser degree from Siam and
 Burma, is in the hands of overseas Chinese.

† Chinese National Currency — the Chinese dollar.

HOW THE CITY IS FED

143

picul (the Shanghai rice picul during this period equalled 172 435 pounds); b. (out-province rice) CN \$12.40 per picul; c. (foreign 437 rice) CNC \$12.30 per picul.¹⁷ At these levels the composition of the rice supply tended to remain stable, with local rice accounting for over 80 per cent of the total. Shanghai in general prefers to eat local rice even when its price rises slightly above that of foreign rice, as usually happens during the local planting season and at certain other times (see below). Foreign rice is a different type from the local product and there is prejudice in Shanghai against its taste and cooking properties. Any great change in these relative prices, however, upsets the balance. When foreign rice is relatively cheap, its Shanghai sales are large, but as fresh supplies continue to be ordered by the merchant groups, the Saigon price rises and the normal price and supply situation is restored. [263]

2. The planting season for rice in the delta area, which lasts 241 from early May to early June. During this period, movements of 435 rice to Shanghai from the delta virtually cease, and the city draws 438 on rice it holds in storage, plus foreign imports. The fact that the planting season usually coincides with the wet period of the plum rains means that the Shanghai price of rice rises sharply from late May to mid-June. New supplies of local rice come into the Shanghai market in early July (i.e., from the previous year's crop, which has been stored in the local collecting centers but which is not moved to Shanghai during the planting season, the greatest peak labor period of the agricultural year). The Shanghai price regains its normal level as a rule before the end of the month.

3. The weather. Hot and/or humid weather tends to rot stored 132 rice, and thus depresses the price by forcing sales, or stimulates it by 435 jeopardizing what is stored. Drought seldom affects harvests 438 seriously in the delta with its network of canals to supply irrigation 505 water. The greatest effect of rain is on the day-to-day movement of rice from local production areas to the Shanghai market. The delta waterways are easily flooded over their banks by rain and wind, and by both in combination with the tide in the stretches which receive tidal inflow from the Yangtze or the Whangpoo.*

* This might be deduced from the discussion of the delta above in Chapter Three, and it is referred to specifically in the two journals cited for this account of the rice

KEY FUNCTIONS

132 The boatmen on these waterways usually refuse to load or unload
 435 rice when it is raining (whether out of regard for their own safety
 438 or for that of their cargo is not clear), and the flow of rice to Shang-
 505 hai stops almost entirely whenever it rains. The Shanghai rice
 market, including foreign and out-province rice, reacts with great
 sensitivity to the rain situation in the city, price changes for rice from
 all sources often following changes in the weather as closely as an
 hour.* The role of the weather in the Shanghai rice market as a
 whole underscores the fact that local sources of rice hold the com-
 manding position, and that the rice moves to the city largely by
 boat. The monthly reports on the rice market refer repeatedly to
 water transport connecting Shanghai with the rice-producing areas
 of south central Kiangsu, but very little mention is made of railway
 transport of rice during the entire period 1920-1936. Highway
 transport of rice is not mentioned at all. The dominance of water is
 so marked that these monthly reports lay great stress on the weather,
 and conclude in one case that "Rain and wind make a great differ-
 ence to the rice merchant's heart."¹⁸

527 4. Traditional festivals, especially the Chinese New Year (a
 435 lunar festival occurring as a rule in early February). Their effects
 438 may be summarized as follows: a. since the New Year is the time
 for settling of accounts as well as for feasting, the farmers need
 cash and sell their rice; the price falls as a result at the beginning of
 the festival period; b. however, the holiday on the farms decreases
 the amount of rice collected and transported to inland centers as
 the festival continues, thus counterbalancing the earlier selling; c.
 banditry resulting from inability to pay debts slows or stops move-

market on an average of ten or twelve times a year, principally from March through July.

* According to records kept by the Public Works Department of the International Settlement at Shanghai (printed each year in the Annual Reports of the Municipal Council from 1920 to 1939), rainy days occurred in the city from 1920 to 1939 on an average as follows:

Number of days on which some rain fell	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	3	4	6	6	8	14	7	5	5	4	4	1
Number of days with rain continuously 6 A.M.-6 P.M.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	1	2	4	4	5	8	4	3	3	2	1	1

HOW THE CITY IS FED

147

that rail transport to Shanghai can compete with water transport. Given the lines, one might assume that they would carry the most important product of the delta. The surprising fact is that they carry such insignificant amounts. Total figures given by the railway for rice haulage leave little or no margin for highway transport of rice, and we may assume that it is negligible.

The relatively small figure of 30,000,000 pounds given for arrivals by sea from domestic sources is probably accounted for by small-lot junk cargoes from the northern and southern shores of Hangchow Bay, and from the seaward-extending tip of Kiangsu just north of the Yangtze. South of Hangchow Bay all of the coastal areas import rice to balance their local rice deficits, and north China has no rice surplus for export.

Most of the foreign rice imports to Shanghai, according to the market reports referred to above, are ordered by rice brokers from Nanking, Tientsin, Hankow, and Ningpo operating at Shanghai as China's leading rice market, and this rice is then shipped from Shanghai to their respective cities. At certain periods when the Ningpo rice brokers ordered directly from Ningpo for Saigon rice, Shanghai's stores of foreign rice became superabundant and its price fell sharply, even producing a fall in the price of local rice during the planting season, as in May 1929. All of these cities are relatively more dependent on foreign rice imports than is Shanghai. The focusing of delta waterways on Shanghai, and the relatively less easy transport in the hilly or semi-arid hinterlands of the other cities mentioned, are certainly as important as the concentration of rice production in the delta in accounting for this difference.

The greatest period of foreign rice invasion on the Shanghai market for consumption in the city coincides roughly with the planting season, showing a natural lag of about one month during which Shanghai stores of local rice are drawn on. As soon as new supplies of local rice enter the Shanghai market in July, the situation returns to normal and prices are stabilized. Foreign rice is also ordered by Shanghai merchants when other natural or threatened hiatuses occur in the local supply due to weather, civil unrest, short supply in storage, or price stoppages. As a rule, these breaks in the local supply are short-lived or do not materialize.

156

KEY FUNCTIONS

256 market. The semi-arid north, where most of China's wheat is
438 grown, has almost no water transportation. Water in the delta has
489 made it possible for wheat production there to become highly commercialized as Shanghai developed into a huge industrial market which water routes made accessible in terms of transport costs for bulk shipments.* This helps to explain the anomaly of Shanghai (rather than Tientsin — a close second) as the largest wheat-milling center in China despite its great distance from China's major wheat-producing areas where other industrial centers, notably Tientsin, also mill flour.

439 Domestic sources of wheat, however, accounted for slightly less
505 than half of the city's supply during most of the 1920's and 1930's. Although Kiangsu sources held the commanding position domestically, wheat also came to the city especially from the major wheat area of Shantung, by sea from Tsingtao, where it was collected largely by rail. Shanghai's connections by sea thus implemented its water connections in the delta in ensuring a steady flow of low-cost cereals. Dependence on overseas sources for more than half of its wheat was more workable economically for Shanghai, with its location and harbor facilities, than for any other China port. It was cheaper for Shanghai to bring in wheat from Canada, the United States, and Australia (the three major overseas sources in order of importance) than for Tientsin, without inland water transport, to bring in wheat from the producing areas of north China beyond its immediate Hopeh region of the north China plain.

These imports of wheat from overseas fluctuated considerably from year to year according to price conditions. As in the case of rice, wheat imports were unusually high in years of civil disorder and (or) rain and floods in the delta area, notably in 1926, and decreased markedly in intervening years of political and climatic stability.²³ Again the inference is that stoppages of water transport in the delta were the key factor. As an ocean port near major world shipping lanes, Shanghai could import at a practicable cost whatever goods normally obtained from the delta which temporary cir-

* Water as rainfall, or as irrigation, also keeps wheat yields higher in the delta than the north China average.

HOW THE CITY IS FED

157

cumstances interfering with inland transport made inaccessible locally.⁸⁴

Other food commodities have a relatively higher unit-value by weight, and are therefore able to move to the city over greater distances, in some cases independently of the water network. Fruit, largely citrus, comes in principally from Chekiang which is just south of the delta but in many areas cut off from water routes by high relief. For this comparatively long-distance overland shipping, the fruit is packed in pine boxes and wrapped in sacking as a protection against frost. In the rugged areas of Chekiang it is carried by porter, and is transferred to junk or sampan when it reaches the edge of the delta.⁸⁵ Other fruit sources for Shanghai are even more distant, but most of them can ship to the city over at least part of the route by sea. Grapes and melons come to Shanghai from Hopeh and Shansi, oranges and lichees from Kwangtung and Fukien, and apples from Liaoning (southern Manchuria).⁸⁶

Fresh meat is sold in the city only in limited quantities and is supplied (except for the tiny foreign consumption before 1941, which drew on refrigerated shipping from New Zealand and Australia) almost entirely from the immediate market-garden area. Fish and eggs are far more important elements in the average Shanghai diet than fresh meat, but some cured or salted meat is available from greater distances. Shanghai's main supply of cured hams comes from Chekiang, via Hangchow, and from Kiangsu and Anhwei by Yangtze steamer. Substantial amounts also come from as far as Szechuan and Yunnan, where the making of famous high-quality hams has long been a specialty. The tremendous cost of transporting hams from Yunnan does not apparently make their price prohibitive, although it does limit the market for them.⁸⁷ High unit-value is of course the basic factor.

Eggs have become industrial raw materials, in addition to their part in the city's diet, with the development of freezing and drying plants to prepare eggs for export. Fresh eggs are also exported from Shanghai in cold storage to places as distant as the United Kingdom. The Shanghai supply for this varied market is drawn from surprising distances. Within Kiangsu, eggs come to the city from all but two of the *hsien*.⁸⁸ These two are in the northernmost part of

439
305438
489
[245]
[258]

[482]

262
438
253[258]
[439]
235
505

158

KEY FUNCTIONS

235 the province where arid north China fairly begins, and where
505 water transport facilities are limited. Eggs also come to Shanghai from places up the Yangtze valley as far as Hankow, transported in bamboo crates holding from 500 to 1000 eggs and carried entirely by water. 40 per cent breakage in transport is given as an average figure.³⁹ This apparently does not make the longer hauls uneconomic, and implies that cheap transportation is an important factor.

[262] Fish, however, after cereals and vegetables, is the most important protein-supplier in the city's diet, and Shanghai handles one third of the fish and marine products marketed in China annually for which there are market records. Seasonal variations in the catch and lack of adequate cold storage facilities make for violent fluctuations in the price of sea fish, in the case of one common species from a yearly low of CNC\$3 per *shih* (200 pounds) to a yearly high of CNC\$50 per *shih*. A good catch is often disastrous to the fishermen because it depresses the Shanghai price below cost, since in the absence of cold storage the fish must be sold within a few days.⁴⁰

226 Shanghai's fishing fleet in the 1930's was about two-thirds sailing
251 junks and one-third steam trawlers, both of which packed their catch at sea in iced barrels. In summer, spring, and autumn the packing preserved the fish for only about two days in this climate, and a premium was put on quick marketing. The fishing boats were allowed only a limited amount of salt for preserving, in order to prevent smuggling abuses. The main fishing grounds off the coast of central China are approximately fifty miles to the seaward of the Chusan Islands, or about 140 miles from Shanghai, a good two days' run for the junks and not much less than that for the trawlers. The catches are of course not all made in one day, so that fish arriving in Shanghai might be as much as four or five days old and in a questionable state of preservation.⁴¹ Small fast power boats from Shanghai met the fishing fleet at the fishing grounds when the catches were good and rushed the fish to market in the city, but this stratagem greatly increased the cost and did not remove the need for making an immediate sale.⁴² Dried and salted fish comes to Shanghai mainly from small villages and islands along the coast of northern Kiangsu and southern Shantung, where it is pre-

HOW THE CITY IS FED

159

served, packed in barrels, and shipped to Shanghai by junk, but this supply also is irregular and its price fluctuates widely.⁴³

226
251

The supply and price of fresh-water fish are much steadier. The catch from the lakes, canals, and rivers of the delta comes in alive in specially constructed boats with built-in wells floored with grating through which the water can circulate freely. The fish are fed en route with powdered egg yolk, and the average journey from source to Shanghai is about three days, or approximately 100 miles. These boats are built for the Shanghai trade, since fish do not travel alive for such relatively long distances to any other market. The boats avoid the lower reaches of Soochow Creek in approaching the city because they fear that its polluted water will harm or kill the fish.⁴⁴ Several alternate routes are available. Fish are also transported alive to Shanghai in tanks from places along the Yangtze as far as Wuhu, Hukow, and Kiukiang, the water being changed several times a day en route.⁴⁵ Although no complete figures exist, it is estimated that the supply of fresh-water fish and its sale in Shanghai are much greater than of sea fish.⁴⁶ This fact is certainly related to the ease of live shipment by water, which maintains a steady supply at a relatively constant cost.

Of the higher unit-value food items discussed above, only fruit and cured hams travel long distances independently of waterways. The extension of the egg supply area to as far as Hankow would seem to be related to the water connections between it and Shanghai. In the case of fish, although Shanghai is an ocean port near the main fishing grounds of the central China coast and served by a large commercial fleet, the city's fish market is dominated by a supply whose freshness, cheapness, and abundance at all seasons is the direct result of inland water transport.

505

Local Rice Surpluses, and the Future

There remain two principal unsolved problems. The first is accounting for a rice surplus in the densely settled delta where so many large cities compete for the food produced on these tiny farms by traditional farming methods. Only indirect explanations can be suggested, but it should be remembered that the Yangtze delta is by no means unique in this respect. The three great rice-exporting

433

HOW THE CITY IS FED

161

surplus began at this period to move to Shanghai and has continued to do so. 433

Grain shipments on the Grand Canal from the delta to Peking had actually become insignificant after the Taiping Rebellion (1850-1864); and ceased entirely in 1901. Sea transport of rice was substituted until 1911, but it never brought from the delta to Peking more than a small fraction of what had previously moved by the Canal. During the nineteenth century, Kiangsu and Chekiang had yearly quotas of tribute rice shipments to Peking of over one million piculs each, totalling for both over 320 million pounds,⁴⁷ or about one-third of the annual rice consumption of Shanghai alone in the 1930's. However Morse suggests⁴⁸ that the rice actually collected (much of which never got to Peking) may often have been six times the official quotas. 505 651 [661]

The population of Peking did not decline after 1911, since the city remained the seat of a northern warlord regime and became China's largest rail junction, especially with the economic development of Manchuria. Its estimated population total in 1936 was 1,400,000, in all likelihood the highest figure it had ever reached, as compared with about 800,000 in 1900. But it was no longer the seat of a court, garrison troops, and an extensive bureaucracy, recruited from all over China including the rice-eating south, and with power to command shipments of tribute rice, which made up part of many official salaries. After Peking ceased to function as the imperial capital, its population subsisted primarily on the millet and wheat readily obtainable from north China, while the flow of rice from the Yangtze delta followed economic rather than imperial dictates. 000

It does however seem possible that rice surpluses in the delta available for urban consumption have been greater since the twentieth-century growth of Shanghai (and of its many urban rivals in the delta) than during the imperial period. The following paragraphs suggest one explanation of this. Another might be that local farmers had less incentive to produce rice when most or all of the surplus went to Peking as tribute, or was absorbed as "squeeze," than when they could sell it in a reasonably free market for consumption in Shanghai. 433

In the early years of the foreign settlements when foreigners were 000

SHANGHAI MANUFACTURING

177

1930's, or about half of the large-scale mechanized soap factories in China. They drew 90 per cent of their raw materials from domestic sources. Lye (potash) was obtainable from plants in Shanghai. Vegetable tallow and vegetable oils (most importantly, cotton, peanut, rape seed, sesamum seed, and castor) came to the city via the Yangtze system from the major producing areas of central China.³¹ The fruit of the tallow tree is gathered in central China in October and the oil pressed out during the winter, but it is not marketed in Hankow and sent to Shanghai until the spring rise of the waterways leading to Hankow makes easy navigation possible. A dry spring makes the market soar in both Hankow and Shanghai.³²

The average Shanghai price before the war was nevertheless substantially below that of foreign vegetable oil imports (despite the production of coconut oil in southeast Asia). Vegetable wax from central China also largely replaced foreign imports of paraffin wax after 1930, when the *likin* (internal customs tax) was abolished by the Kuomintang government. The cheapness of domestic tallow, oils, and wax in Shanghai relative to seaborne foreign imports was clearly related to the use of inland water transport in bringing these products to the city. The fact that 80 per cent of Shanghai's soap production in the early 1930's was marketed outside Kiangsu also suggests that the city's water connections with its hinterland were basic in locating the industry there. Only 10 per cent of the Shanghai soap industry's raw materials were imported, largely coconut and olive oils for making especially high-quality soap for the domestic market.³³

By contrast, the Shanghai match industry was almost entirely dependent on overseas sources for its raw materials. It imported all of its sulphur (largely from Japan), all of its paper and cardboard (from Sweden), and all of its match-making machinery (from Japan). Most of its phosphorous was also imported, but some was produced locally from animal bones. Ample sulphuric acid was produced in Shanghai. For this product of such high unit-value by weight, raw materials to which so much value was added by manufacture could economically be imported, and the finished matches were marketed in every province of China.³⁴ Shanghai was never-

388
438388
438
433[65]
505
388
438
439381
439

SHANGHAI MANUFACTURING

181

condition operates to approximately the same degree in all Chinese industrial centers.³⁹ The second operates for all Chinese industrial centers, but not to the same degree.

Only two important carriers are involved: railways and waterways. Highway transport by truck remains negligible in China, relative to the scale necessary for the maintenance of modern manufacturing, and with the shortage of fuel, vehicles, and parts as well as of adequate roads it is an impractically expensive carrier. Non-mechanized overland carriers in general use in China (porters, wheel-barrow, pack animals, carts) are also notoriously expensive, and are inadequate to handle volume movements.* Representative rates for railway transport of bulk goods (exclusive of coal) in carload lots in China during the 1930's ranged from the equivalents of US\$.02 to US\$.07 per ton/mile.⁴⁰ This compares with an average ton/mile rate on United States railways during the same period of about US\$.01.⁴¹ Accurate or even representative rates for water transport in China are not available, but the average for unobstructed inland routes may be estimated at between US\$.018 and US\$.02 per ton/mile during this period. In any case, where adequate water transport is available in China, it is a cheaper carrier than railways under present conditions, and can handle bulk shipments.

As we have pointed out above in Chapter Seven Shanghai is not a major rail center, and the two railways which serve it are not

that year under five headings. Expressed in percentage terms, these costs are tabulated, for United States manufacturing as a whole, and for the textile industry in the United States:

	All Manufacturing (%)	Textile Manufacturing (%)
labor and salaries	53	57
materials and supplies	37	35
fuel	2	1
purchased electric power	1	4
other	7	3
	<u>100</u>	<u>100</u>

"Materials and supplies" is not defined. No figure is given for overhead and interest, so that all of these figures must be scaled down in order to make them comparable with the figures cited for Shanghai.

* Average ton/mile rates for truck transport in China range from the equivalents of US\$.30 to US\$.50. For porter and wheelbarrow they often reach US\$1.00 per ton/mile.

435
489

489

[497]

[505]

SHANGHAI MANUFACTURING

183

course depressed by the high figure for raw cotton. Nevertheless it seems clear that Tientsin, despite its rail and water connections and its location in a major cotton-producing area, paid a considerably higher price than Shanghai for delivered raw cotton. If this was true for raw cotton, we may assume that it was true for most of the other industrial raw materials consumed in Tientsin, with the obvious exceptions of coal and the wool, hides and skins of north China, and the possible exception of wheat.* If Tientsin could obtain the necessary raw materials in these latter cases more cheaply than Shanghai, this is further evidence of the paramountcy of the Shanghai market and of the market-oriented character of its manufacturing. If Tientsin paid a higher price than Shanghai for most delivered raw materials, we may assume that other Chinese industrial centers did so too.

288
435

Water transport has been a key factor in the development of manufacturing in Shanghai. The city's railway connections are inferior to Tientsin's, and yet its manufacturing apparently paid less for most of its raw materials, and in fact was a greater consumer than Tientsin manufacturing of the leading industrial raw materials of north China: coal, hides, and wheat, all of which can move to Shanghai by sea from north China ports. In turn, the primacy of the Shanghai market depends in large measure on the water transport network which includes half of China in the city's tributary area. The market is able to exercise its attractiveness for manufacturing of all kinds by its ability to draw to its generally resource-poor area by sea and river transport the industrial raw materials which it needs.

505.

Coal and Electric Power

The single most important industrial raw material, coal, has been left for final consideration, since it plays a major role in nearly every industry, directly, or in the form of electric power.

375

* Shanghai nevertheless led Tientsin in the 1920's and 1930's in the consumption of coal and in the production of leather goods and flour, and in fact shipped nearly 10 per cent of its total flour production to Tientsin on an annual average. (For comparative figures on consumption of coal and production of leather goods and flour, see respectively Leonard Ting, "The Coal Industry in China" (1937), p. 217; Chinese Year Book (1936), p. 1153; Y. C. Chang, "Flour Milling in China" (1922), p. 219).

SHANGHAI TODAY AND TOMORROW

199

in Chapter Ten (it constituted probably Shanghai's outstanding advantage for manufacturing), the present situation is discouraging. We may assume that the newly rebuilt railways are now carrying much larger amounts of coal from north China to Shanghai than they did before the war, but this greatly increases its price as against sea shipment, and is unlikely to have the necessary capacity. Industrial machinery, liquid fuels, rubber, chemicals, and the other goods which were imported from overseas and which are vital to Shanghai's industrial recovery are also short under the combined Nationalist blockade and United Nations embargo.

Ocean shipping using the port virtually disappeared during 1949 and most of 1950. Toward the end of 1950 it reappeared on a very small scale, and now averages perhaps two or three ships a month, all in the coasting trade. The entrances to the Yangtze have been mined by the Nationalists, and the main ship channel in the estuary has not been dredged since 1937. Sunken ships, to which floating mines still occasionally add, further block the river. Until early 1951 there was a small trade with Hong Kong, but this has now nearly disappeared with the adoption of the United Nations embargo in December 1950, and the few ships which call at Shanghai are restricted almost entirely to the trade with Tientsin, Tsingtao, and Dairen. Rates are prohibitively high, and all imports and exports through the port of Shanghai are rigidly controlled by the government. Luxury goods and most consumers' goods are excluded from the list of admissible imports. The city's busses and most of its other gasoline vehicles have been converted to run on charcoal gas. Export and import licenses can be obtained only where it is considered in the national interest, but buyers to whom exports might be sent are in many cases unreachable, as witness the consistent import surplus for Shanghai itself of 100 to 120 per cent over exports during 1951.*⁴ Such conditions are crippling for a city which

* The Soviet bloc however seems now to be filling the gap in China's foreign trade left by the shrinking of commercial relations with the West, judging from current reports. (See Ch'en Han-seng, "The Future of China's Foreign Trade" (1952), *New China News Agency Bulletin*, September 29, 1951, *Hsin-Hua Yüeh-Pao*, October 1951, *Ching-Chi Chou-Pao*, September 27, 1951 and April 24, 1952, *Peoples' China*, August 1, 1952.) But for trade with the Soviet bloc, though it is still a new development whose permanent outlines are uncertain, Shanghai is in a relatively

KEY FUNCTIONS

- 505 not only depended heavily on seaborne supplies, but which had a
439 large and important transit trade.

As if in a commentary on the nature of the city's food supply,
433 food, in particular rice, has remained cheap and plentiful throughout the period of Communist control. Order was quickly restored in the delta in 1949, and the flow of low-cost food to the city was maintained despite a nearly universal food shortage or famine in the rest of China during the winter of 1949-50, and despite the Nationalist blockade, which prevented any substantial amounts of food from arriving in the city by sea. The Communist Government has apparently been able to solve, at least to a degree, the problem of local rice supply during the planting season and at festival periods, by controlling prices and arranging for large government purchases which are released on the market at stable prices whenever the situation requires. There is no suggestion that local food supplies are not entirely adequate to meet the city's demands under such a system of management. While no official figures have been released, it is unlikely that Shanghai's population is substantially less than the four millions it had reached in 1936; it may have risen closer to the five million mark, since the great influx of people after the Japanese war has not apparently been balanced by the still limited exodus.*

- [162]
288 Nationalist bombings during the winter of 1949-50 did only minor industrial damage, and came to an end by late 1950 with the arrival of jet defense planes from the Soviet Union and the Nationalist loss of the Chusan Islands, which had been the major base for the bombings of the city. A continuing deterrent to industrial recovery however has been the still inadequate domestic production of raw cotton. Several cotton textile factories in the city were obliged to shut down entirely during 1949 and 1950 for lack of raw cotton, and while all or most of these have subsequently reopened, not enough cotton is coming in to maintain peak production.†

poor position, and its economy has in the past been closely geared with that of the West.

* See above, p. 21. Foreign and Chinese press reports still consistently refer to Shanghai as the fourth largest city in the world, with a population given variously as 5 or 6 million.

† Hsin-Hua Yüeh-Pao for November 1951, 130-131, reports that while production